A Reassessment of Prospects for Activity Levels in the UKCS

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Methodology and Assumptions

1. Large financial simulation model including Monte Carlo risk analysis employed utilising 3 databases as follows:
   a. Historic field production, discoveries, field sizes, E and A effort.
   b. UKOOA field database (late 2003 vintage) sanctioned fields (270), incremental projects (135), probable (43) and possible fields (40).
   c. Database of technical reserves updated (199 fields). Includes some fields formerly in possible category.

2. New discoveries modelled according to following procedures:

   a) Exploration effort based on combination of (i) average since 1997 and (ii) prospective oil/gas price behaviour (sustained).

Three oil/gas price cases as follows:

	Oil Price (real) $/bbl	Gas Price (real) Pence/therm
High	25	24
Medium	20	18
Low	15	14

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The numbers of exploration wells (linear trend) in relation to the 3 price cases are as follows:

	2003	2020	2030
High	35	25	15
Medium	25	15	10
Low	15	10	5

b) Success rates based on combination of (i) experience in period since 1997 and (ii) size of effort. In relation to (ii) it is assumed that higher effort is associated with more discoveries but lower success rate than with medium effort. Similarly with medium and low effort. For whole of UKCS success rate under Medium Effort/Medium Price = 25%.

Technological progress maintains these success rates in the period to 2030.

Data on discoveries for the period from 1997 were taken from the database.

Data on average sizes of discoveries were also taken from the database.

3. The aggregate historic data on (i) exploration effort and (ii) discoveries were disaggregated according to main regions, namely SNS, CNS, MF, NNS, WOS and IS. Regional trends were established for relative exploration effort, discoveries and success rates. This includes splitting according to type (oil, gas and condensate).

4. Using the above information the Monte Carlo technique was employed to project discoveries in all 6 regions in the period to 2030.

5. In the Monte Carlo modelling it was assumed that the size distribution of discoveries would be lognormal following historic evidence. The SD was set at 50% of the mean value. The mean size of field decline through the period was again based on historic evidence. Monte Carlo modelling was also used to calculate the field development costs. For each region the average development cost (per boe) of fields sanctioned in 1990's plus the probable and possible fields was calculated. The SD was assumed to be 20% of the mean.

6. The annual numbers of field developments going ahead were assumed to be constrained by the capacity (physical and financial) of the industry. Over the longer term the ceilings on the total numbers of potential field developments (excluding incremental investments) were assumed to be as follows:

High Price	25
Medium Price	20
Low Price	15

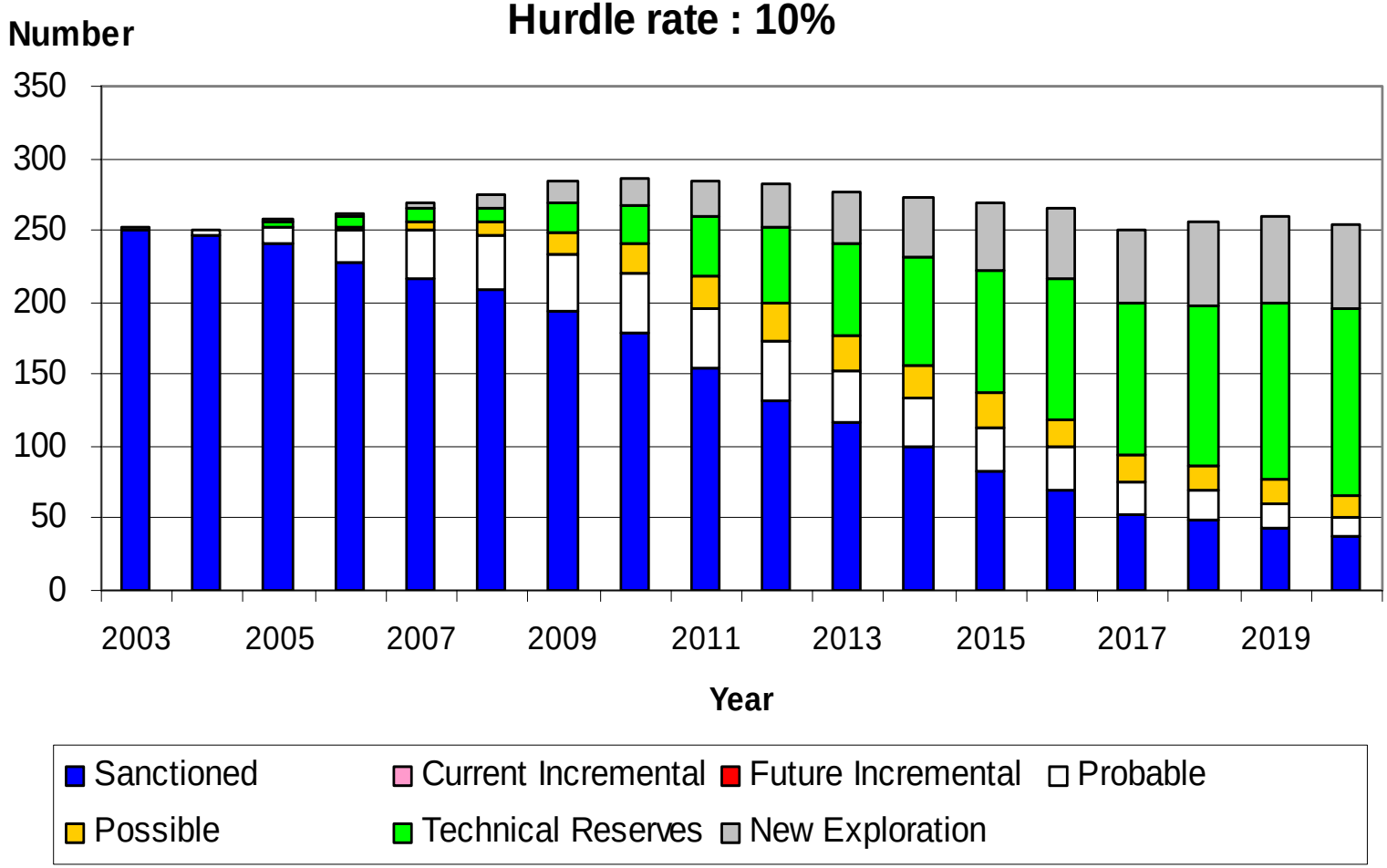
The constraint took the form of curtailing the number of fields in the technical reserves category from going ahead. The Monte Carlo technique was used to project through time the particular fields in this category which could be developed. Mean development costs for technical reserves were set at $1/boe higher than the mean for new discoveries.

7. The numbers of field developments were constrained by an economic hurdle. Costs of capital of 10% and 15% in real, post-tax terms were employed.

Incremental Projects

1. Those currently being examined should mostly be executed in next 3 years if they pass economic hurdle.
2. It is very likely that further incremental projects will be examined in medium/longer term.
3. To obtain understanding of eventual potential further hypothetical incremental projects were modelled. They are based on trends in volumes and costs for incremental projects over the past few years.
4. The execution of the additional incremental projects depends on the prolongation of the lives of the infrastructure and possibly other incentives.
5. No guarantee that extra projects will be undertaken.

Potential Number of Fields in Production
$20/bbl and 18p/therm
Hurdle rate : 10%



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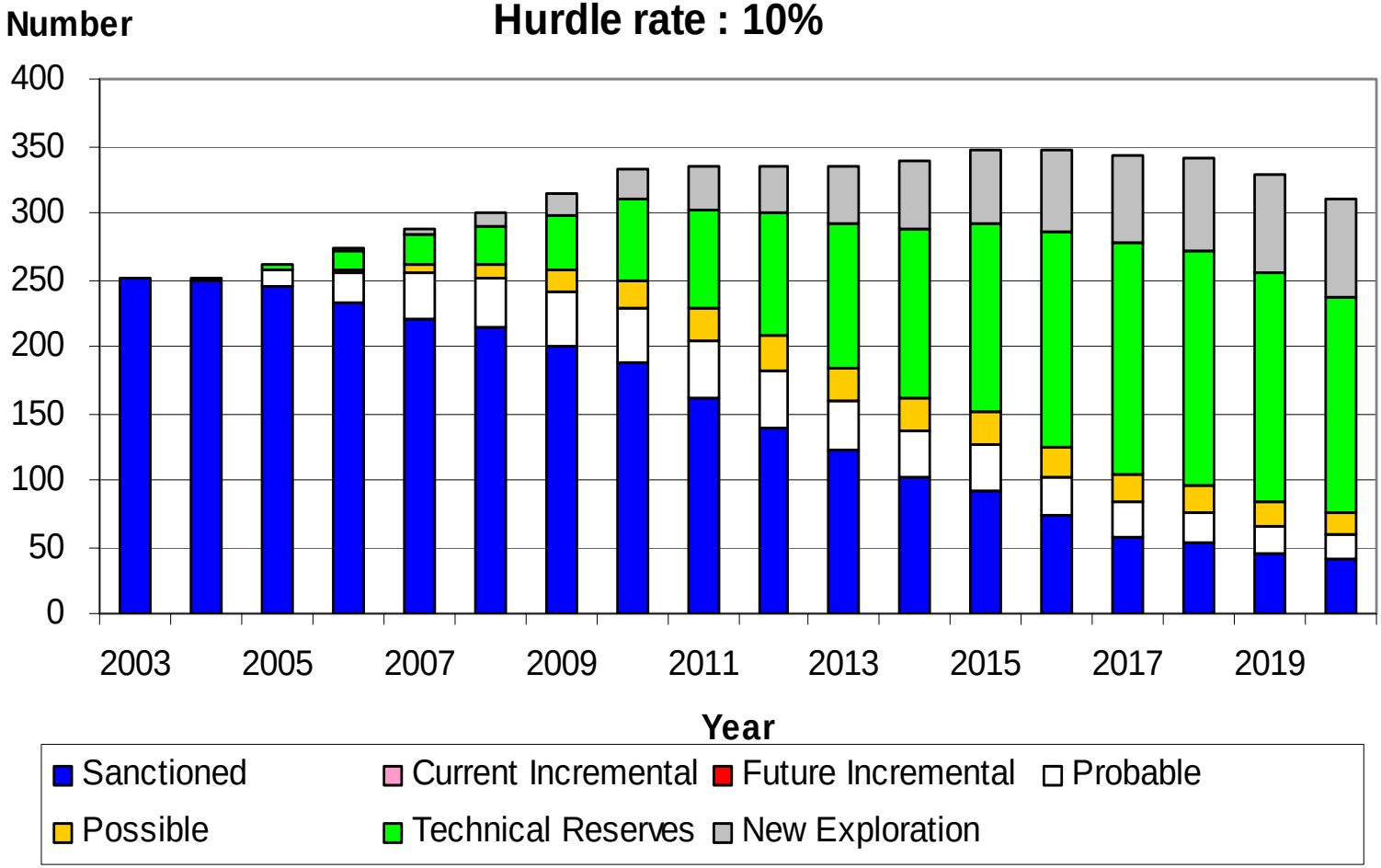
Potential Number of Fields in Production
$25/bbl and 24p/therm
Hurdle rate : 10%



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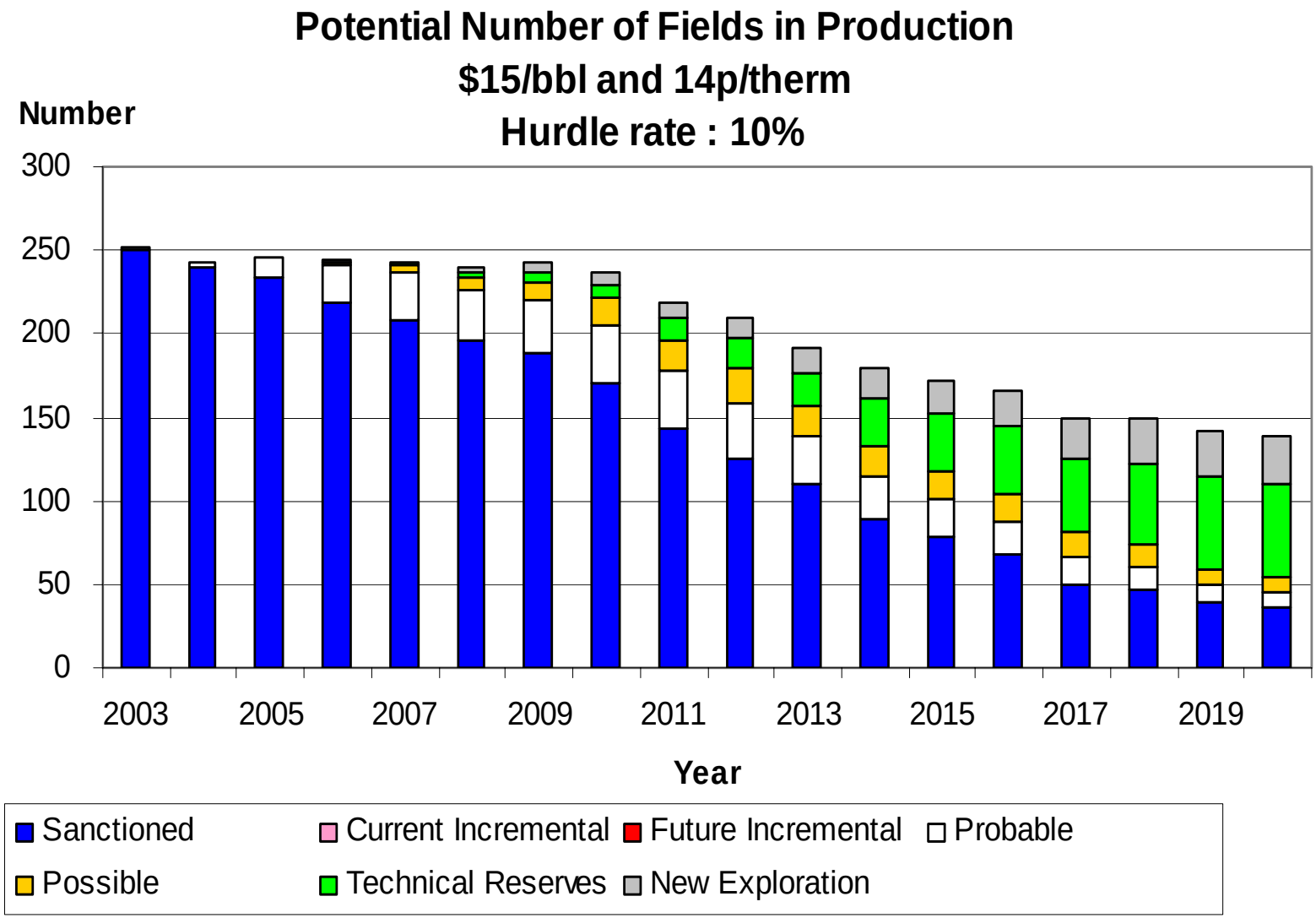

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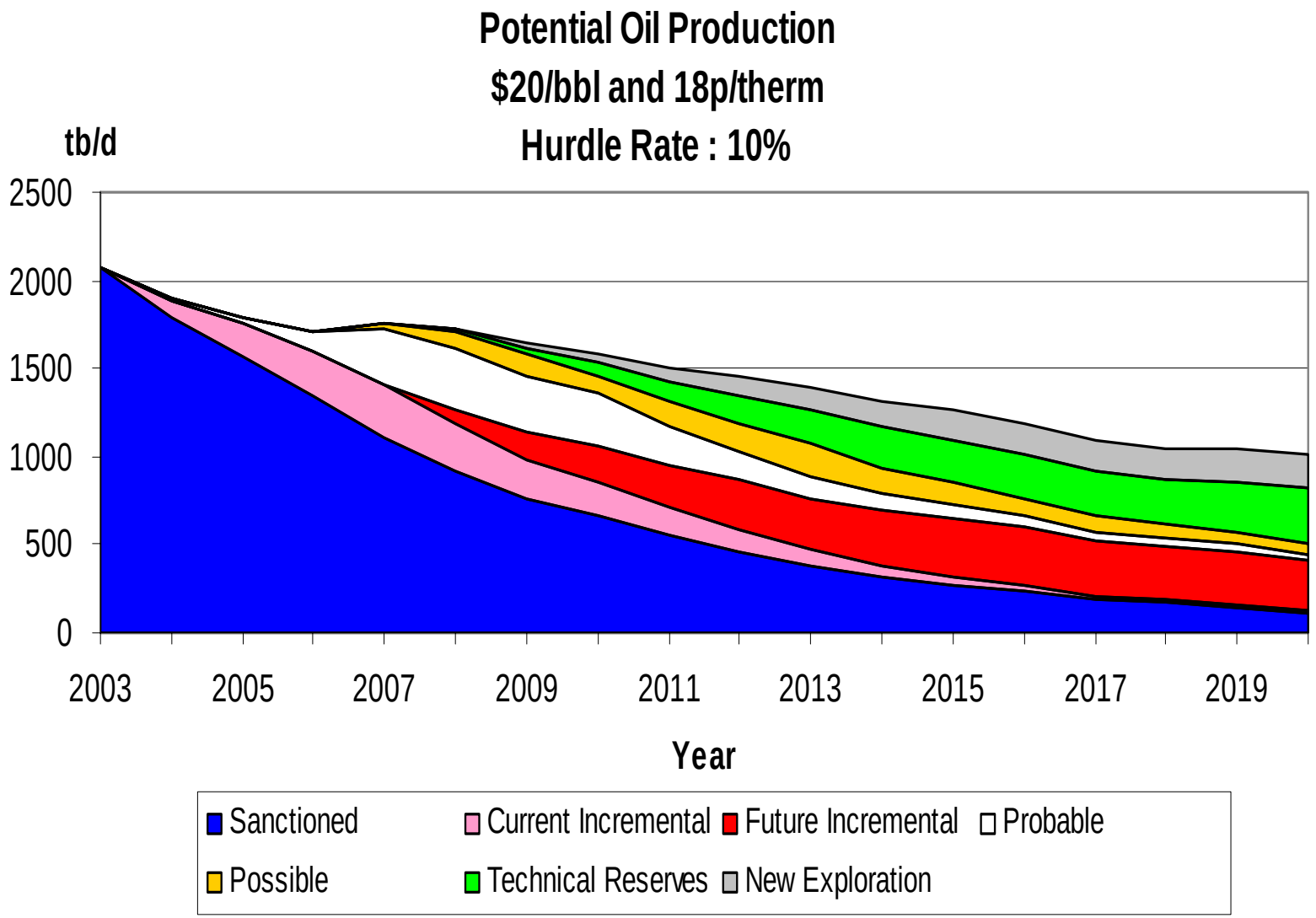

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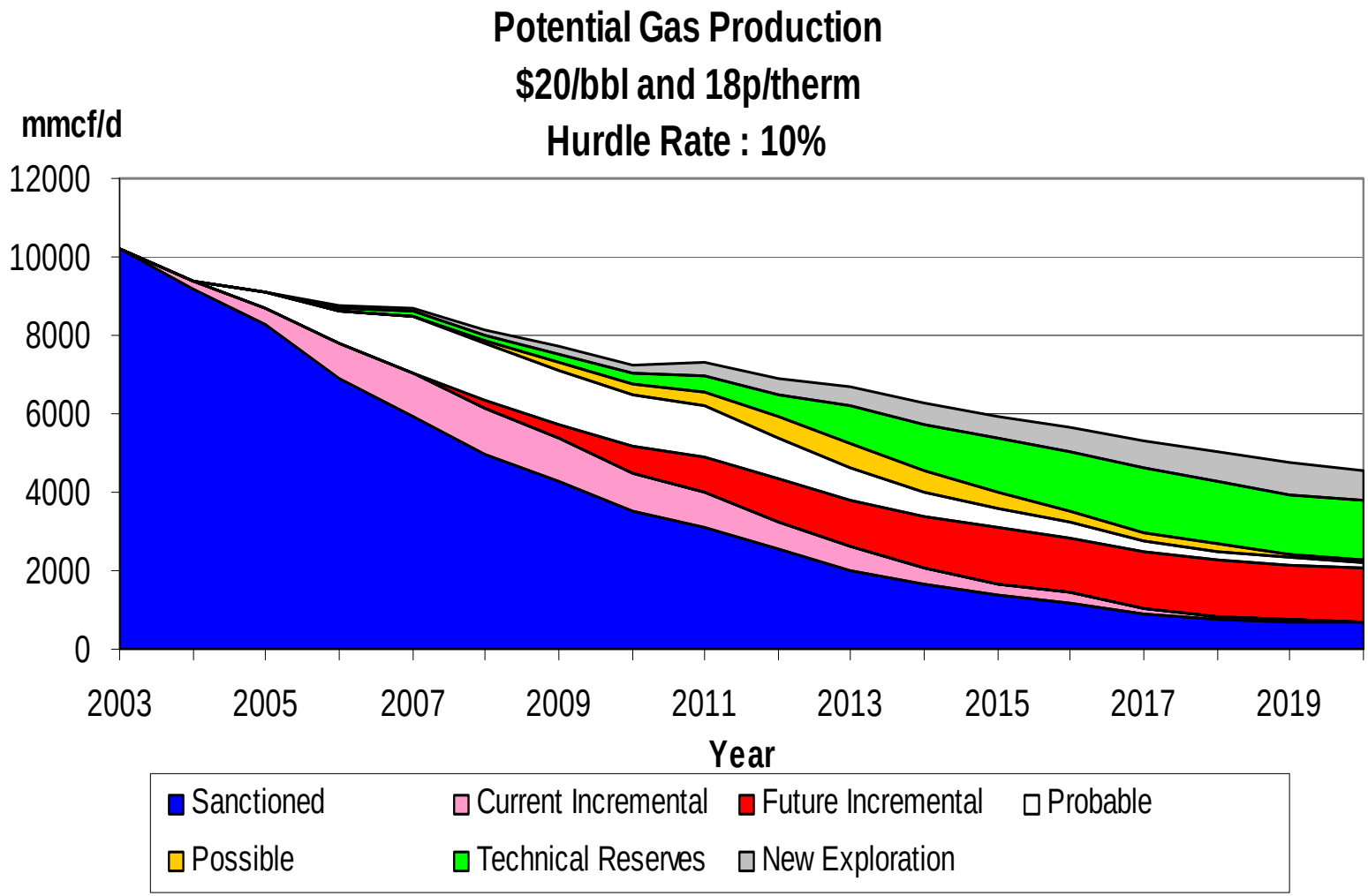

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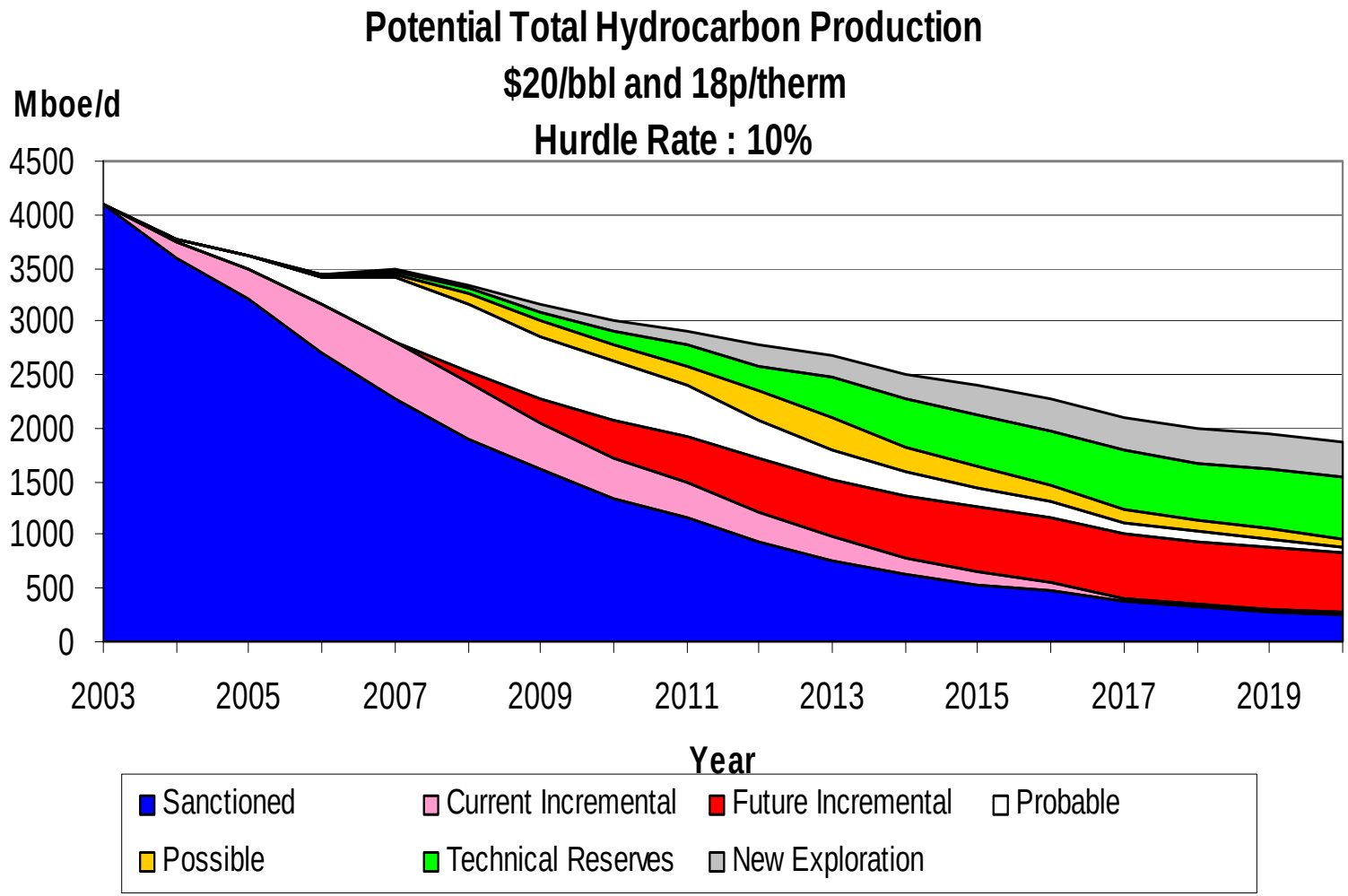

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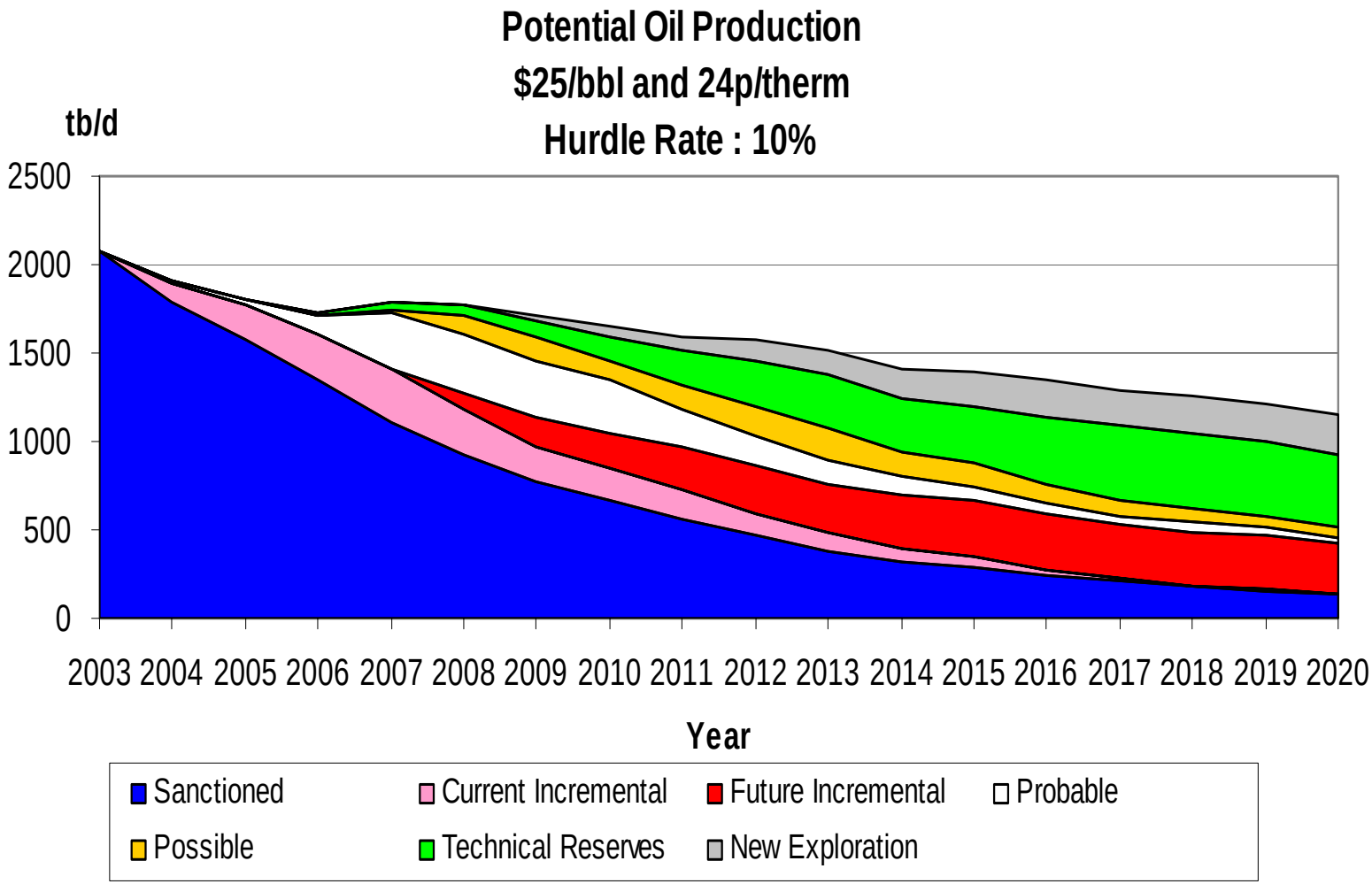

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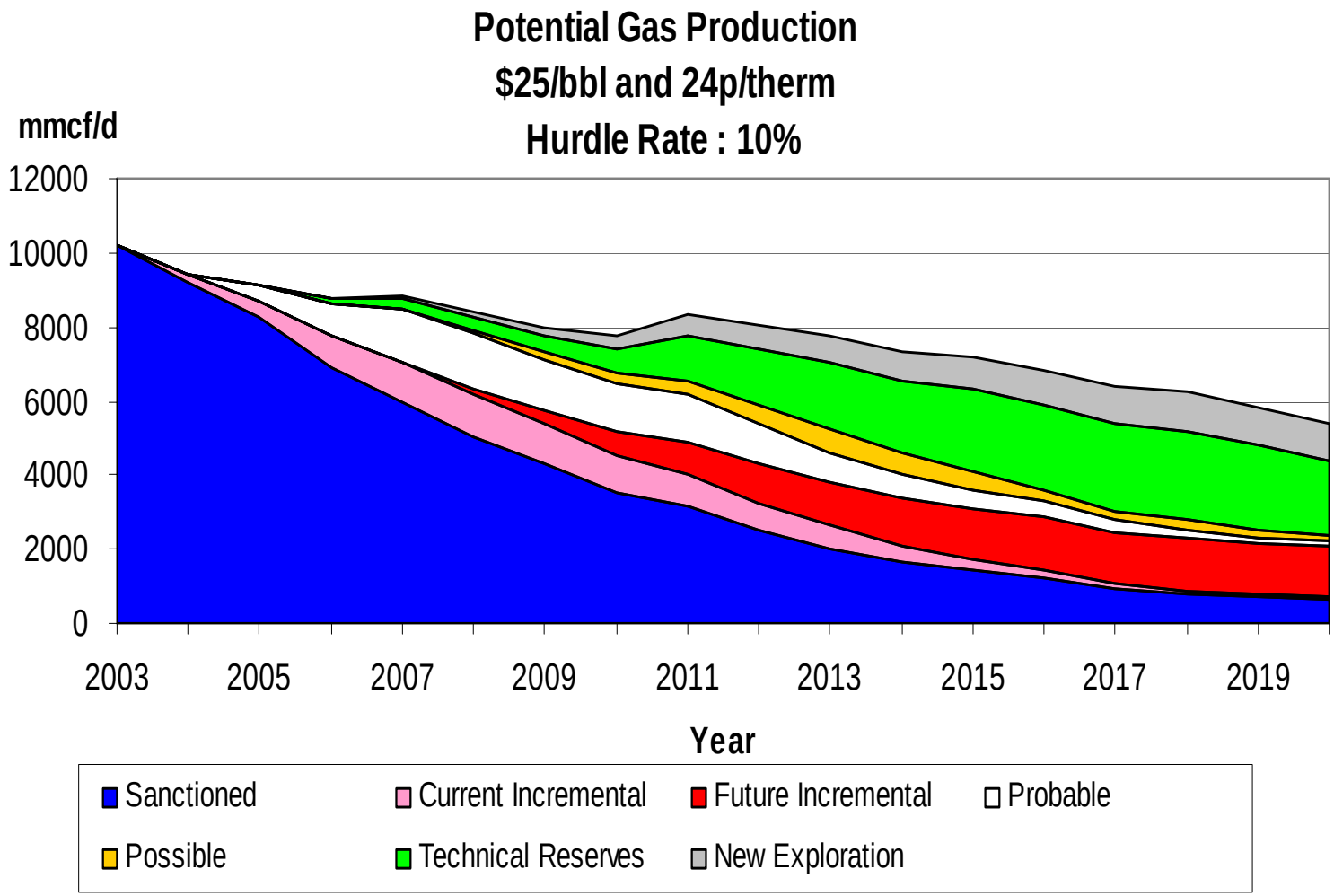

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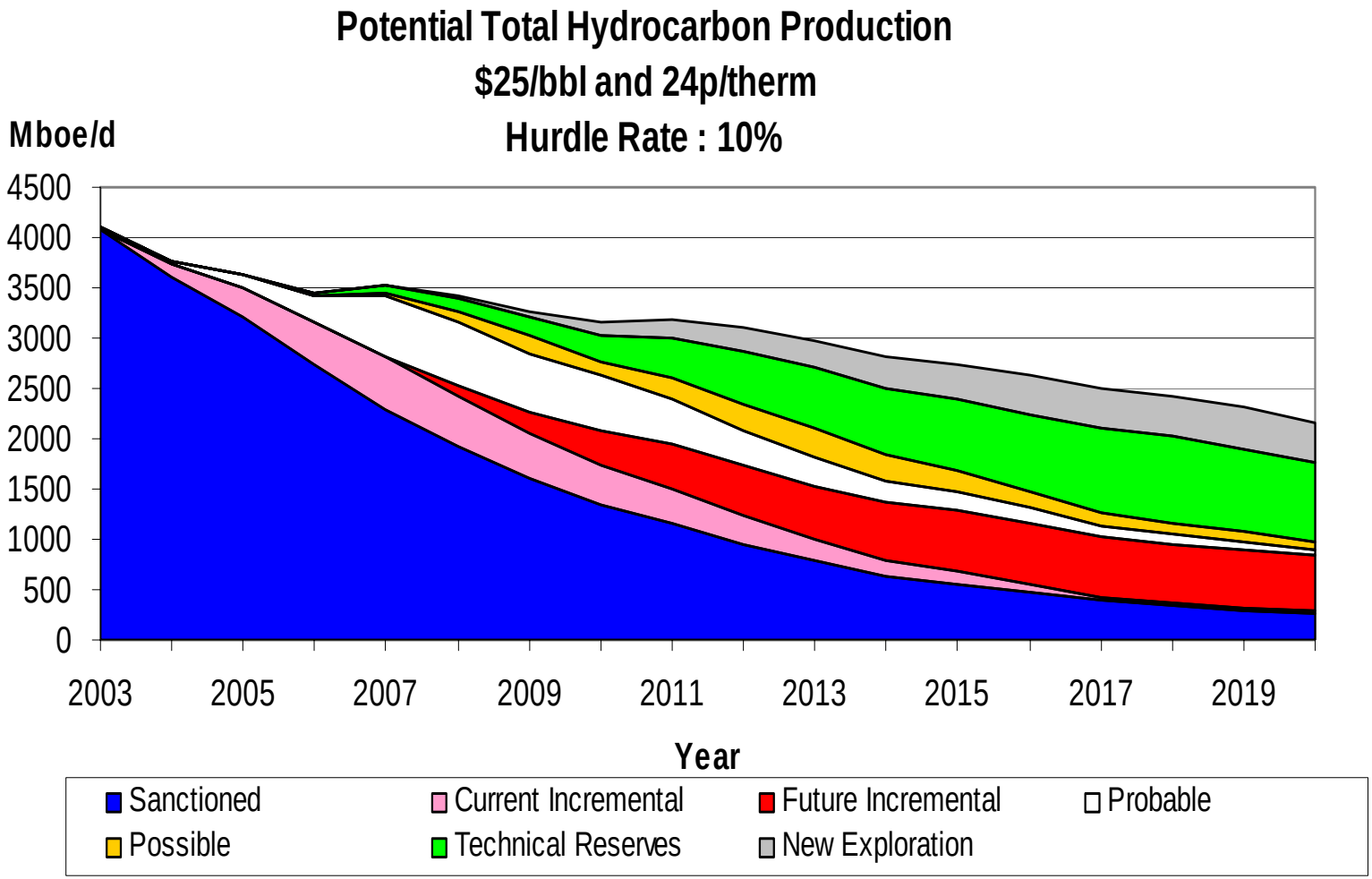
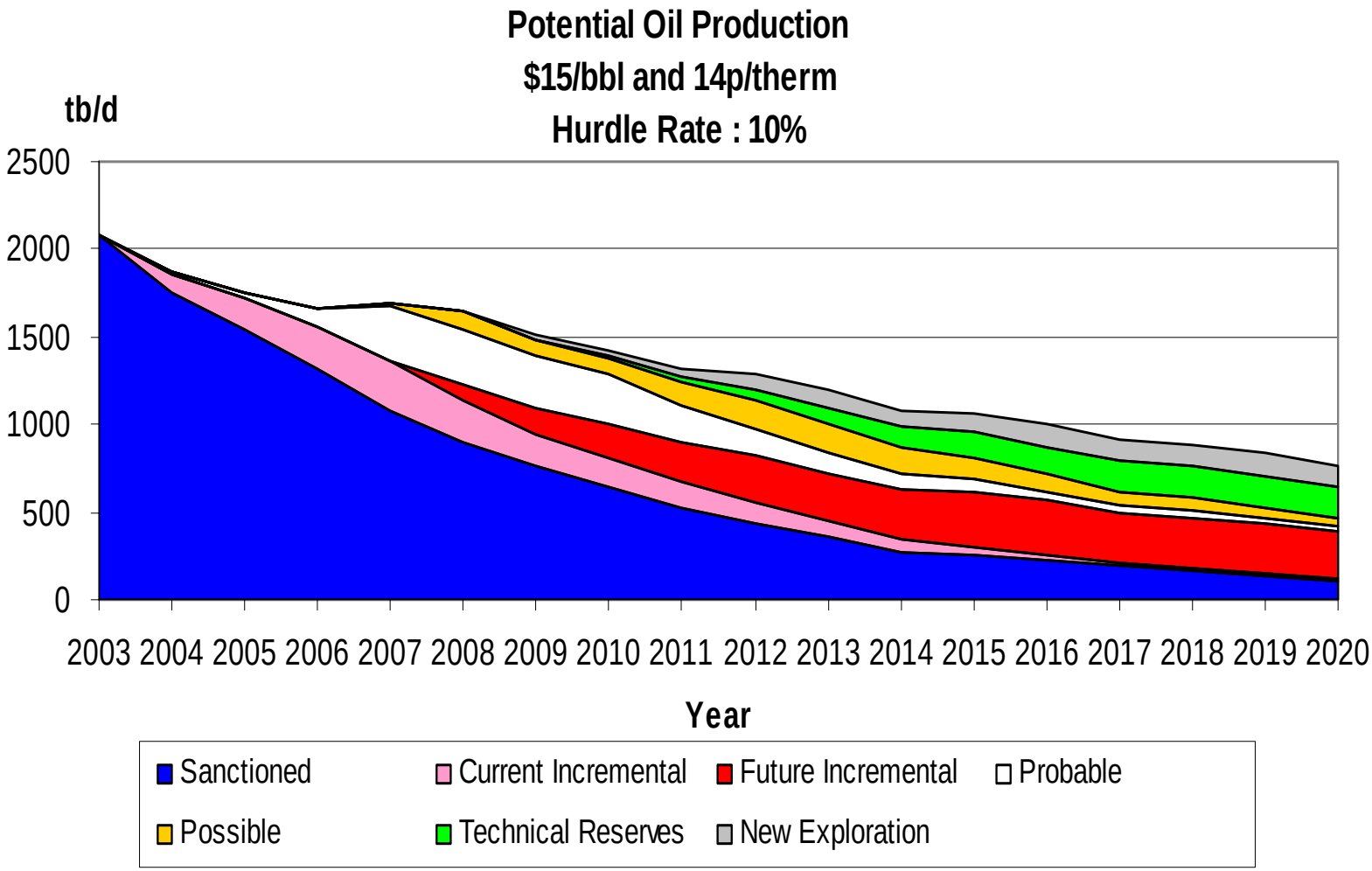

Potential Total Hydrocarbon Production
$25/bbl and 24p/therm
Hurdle Rate : 10%
Mboe/d
4500
4000
3500
3000
2500
2000
1500
1000
500
0
2003
2005
2007
2009
2011
2013
2015
2017
2019
Year
Sanctioned
Current Incremental
Future Incremental
Probable
Possible
Technical Reserves
New Exploration



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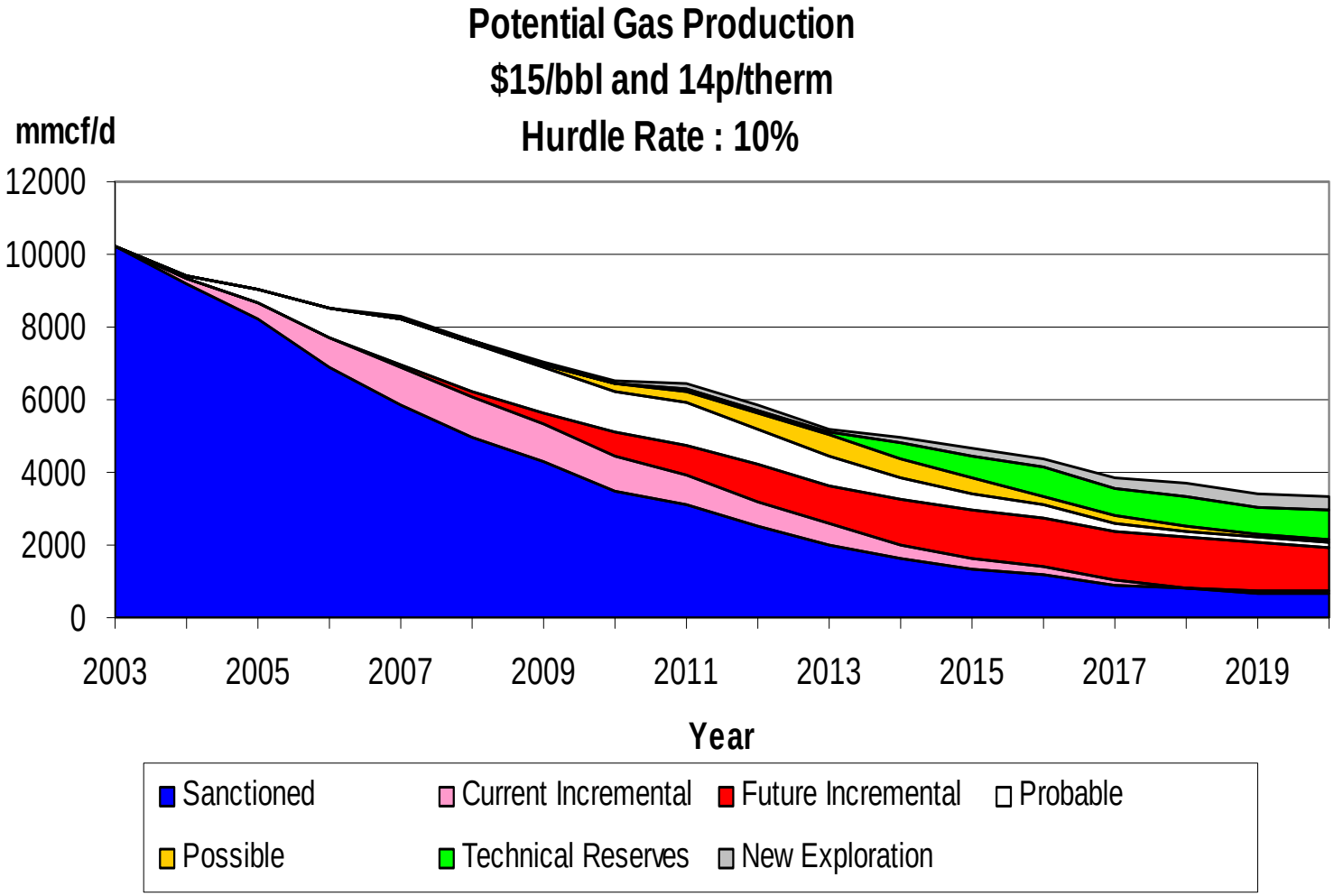

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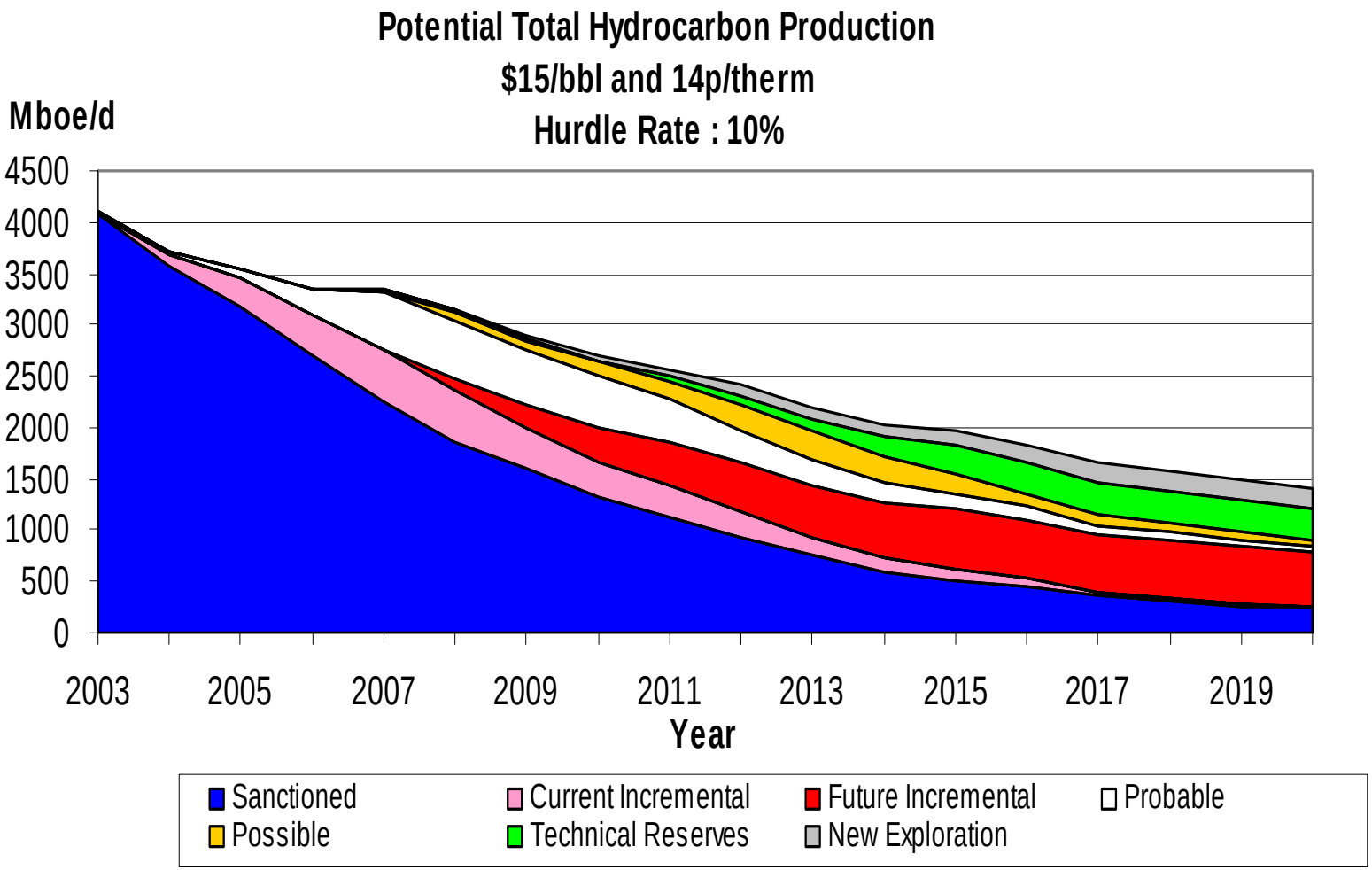

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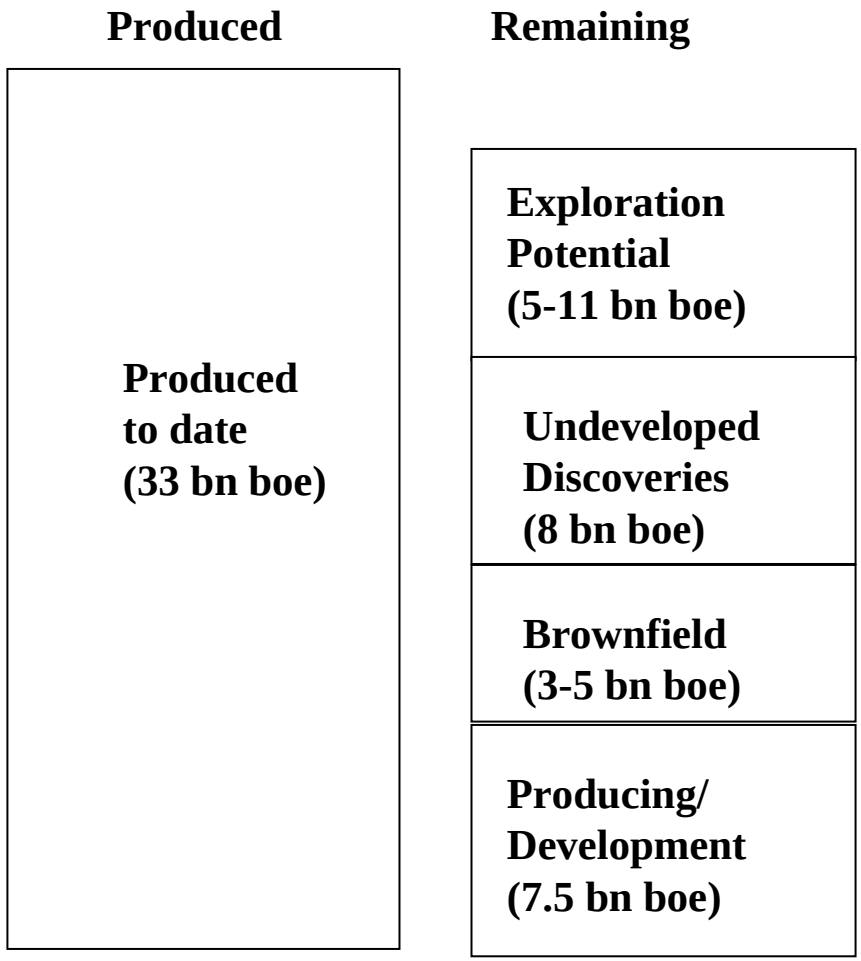
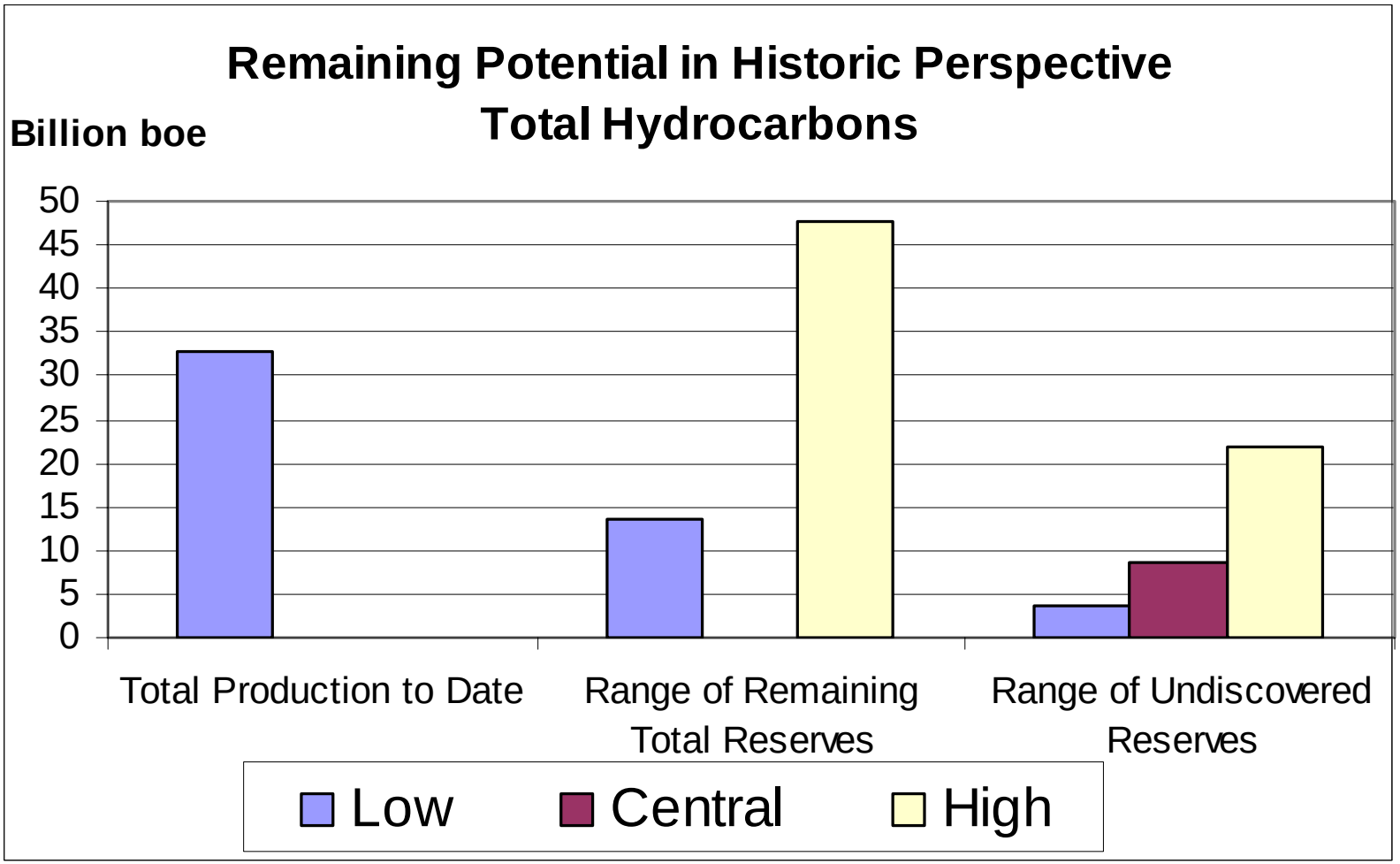
Table 5
Cumulative Potential Production from 2004
(bn boe)
$20, 18p price case, 10% Cost of Capital

	Sanctioned Fields	Current Incremental Projects	Probable Fields (excluding Incremental Projects)	Possible Fields (excluding Incremental Projects)	Technical Reserves (excluding Incremental Projects)	New Discoveries (excluding Incremental Projects)	Future Incremental Projects (from all categories of fields)	Aggregate
2010	6.1	1.0	1.0	0.2	0.1	0.1	0.3	**8.7**
2020	8.2	1.5	1.7	0.8	1.7	1.1	2.3	**17.2**
2030	8.5	1.5	1.8	0.9	3.3	2.2	3.8	**22.0**

UKCS Reserves



Source: UKOOA, 2004



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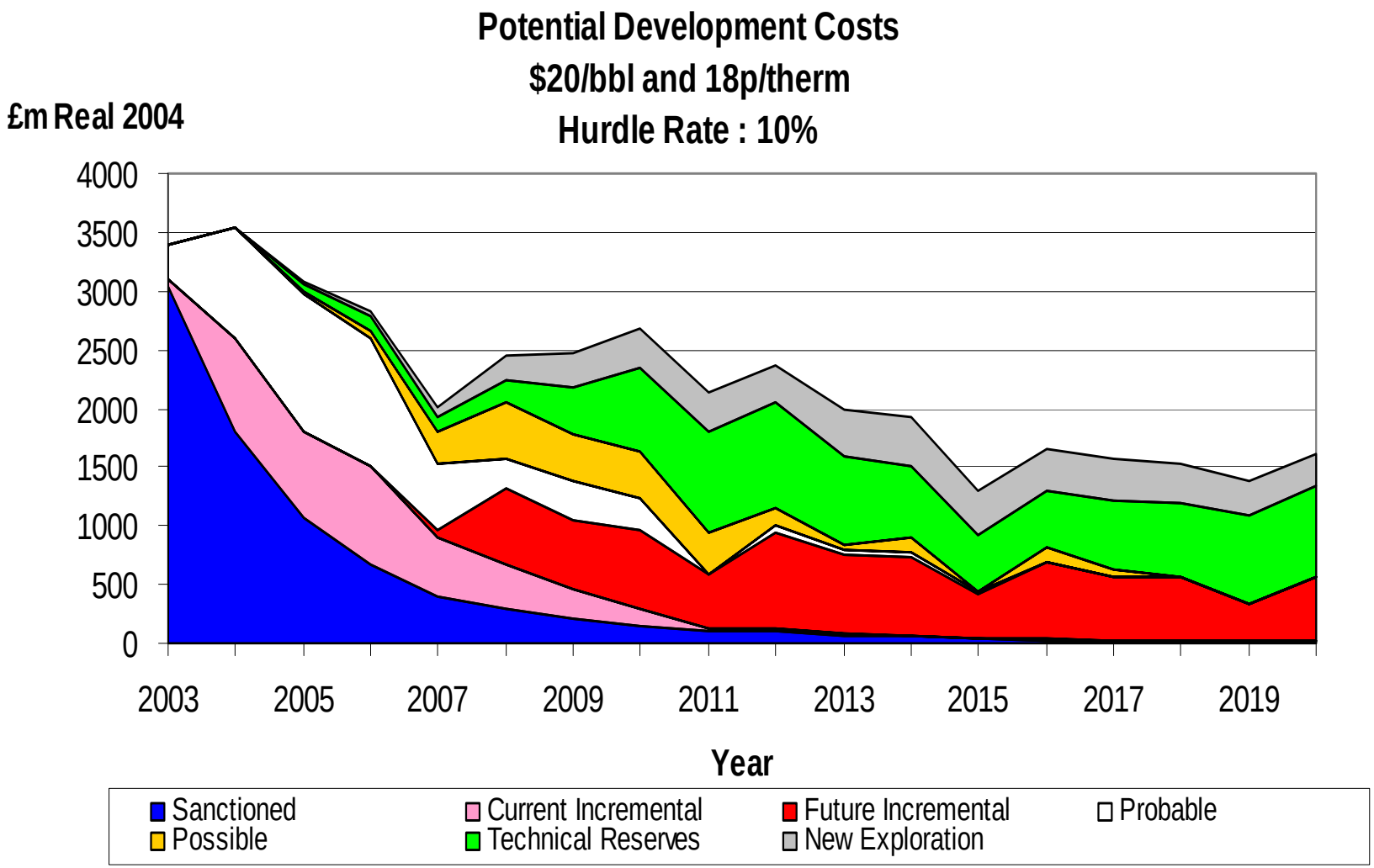

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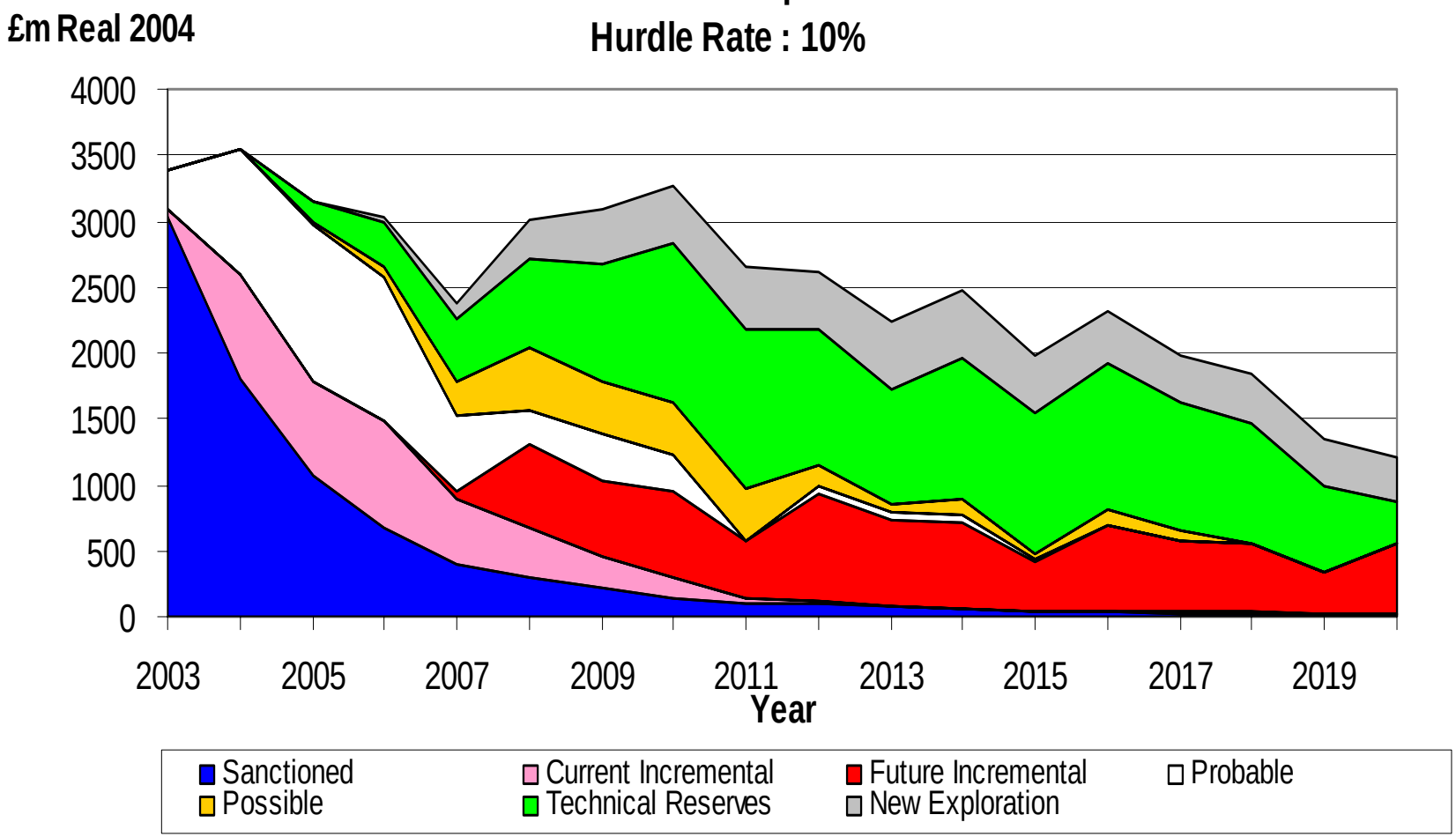
Potential Development Costs
$25/bbl and 24p/therm
Hurdle Rate : 10%



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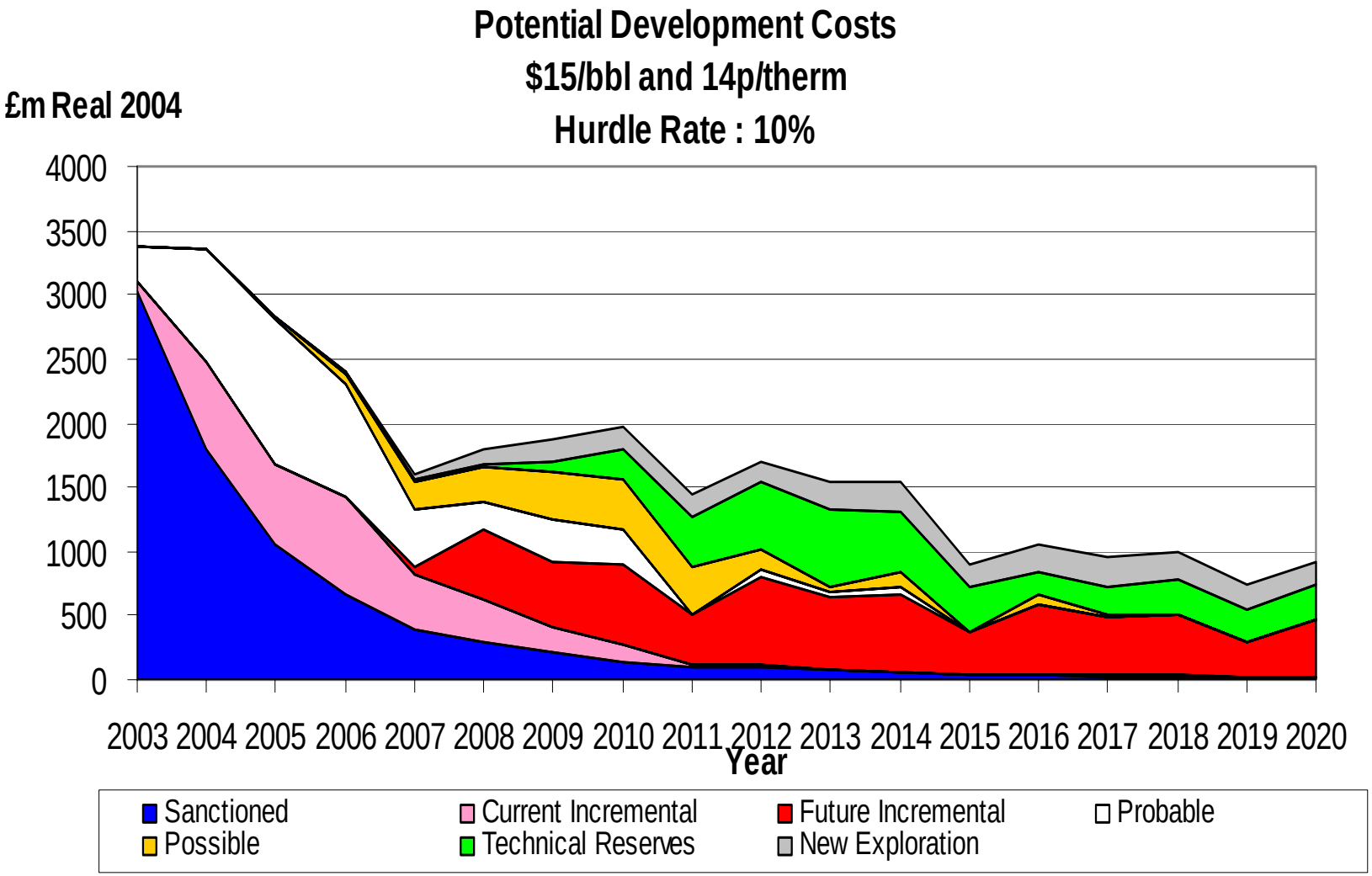

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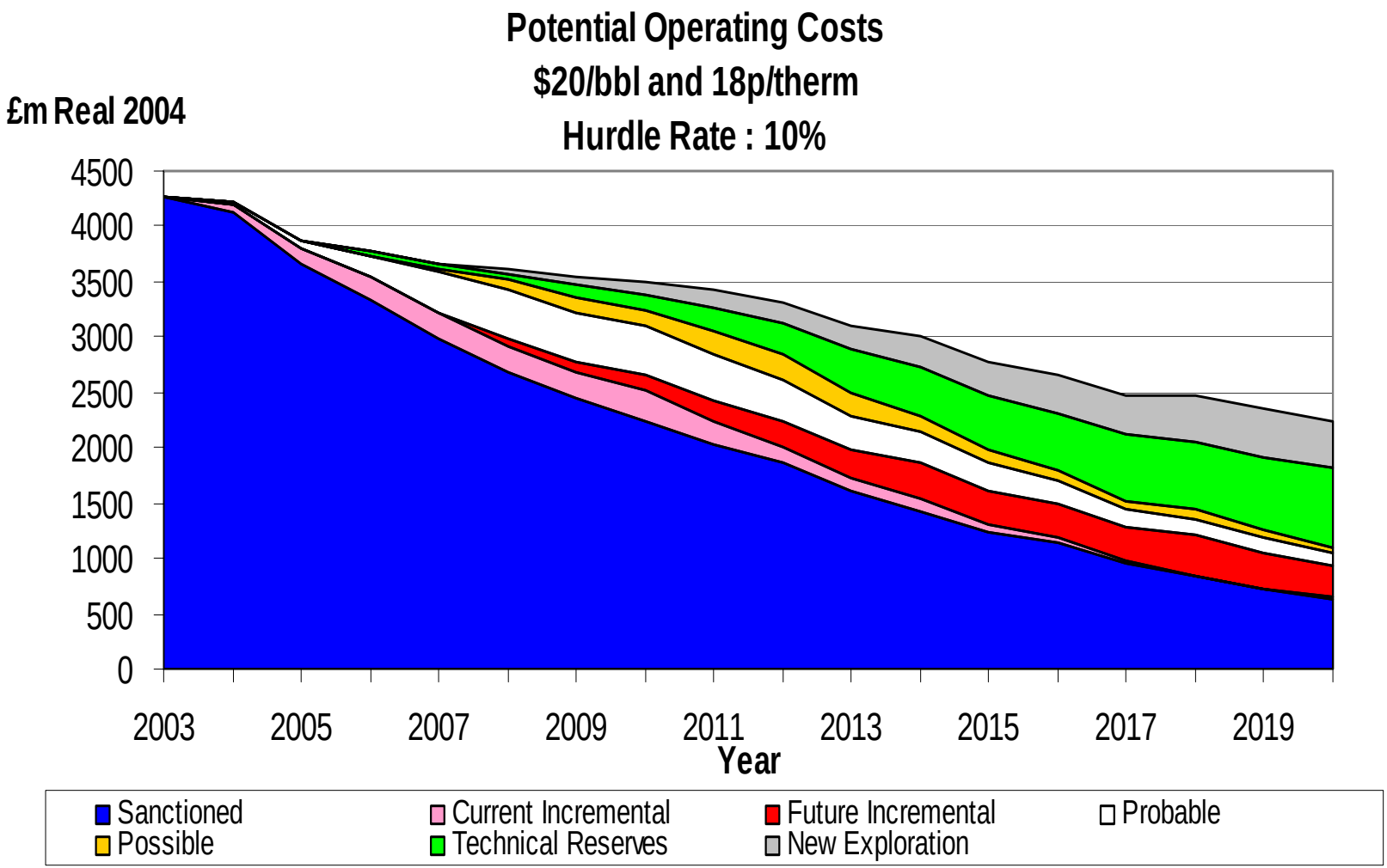

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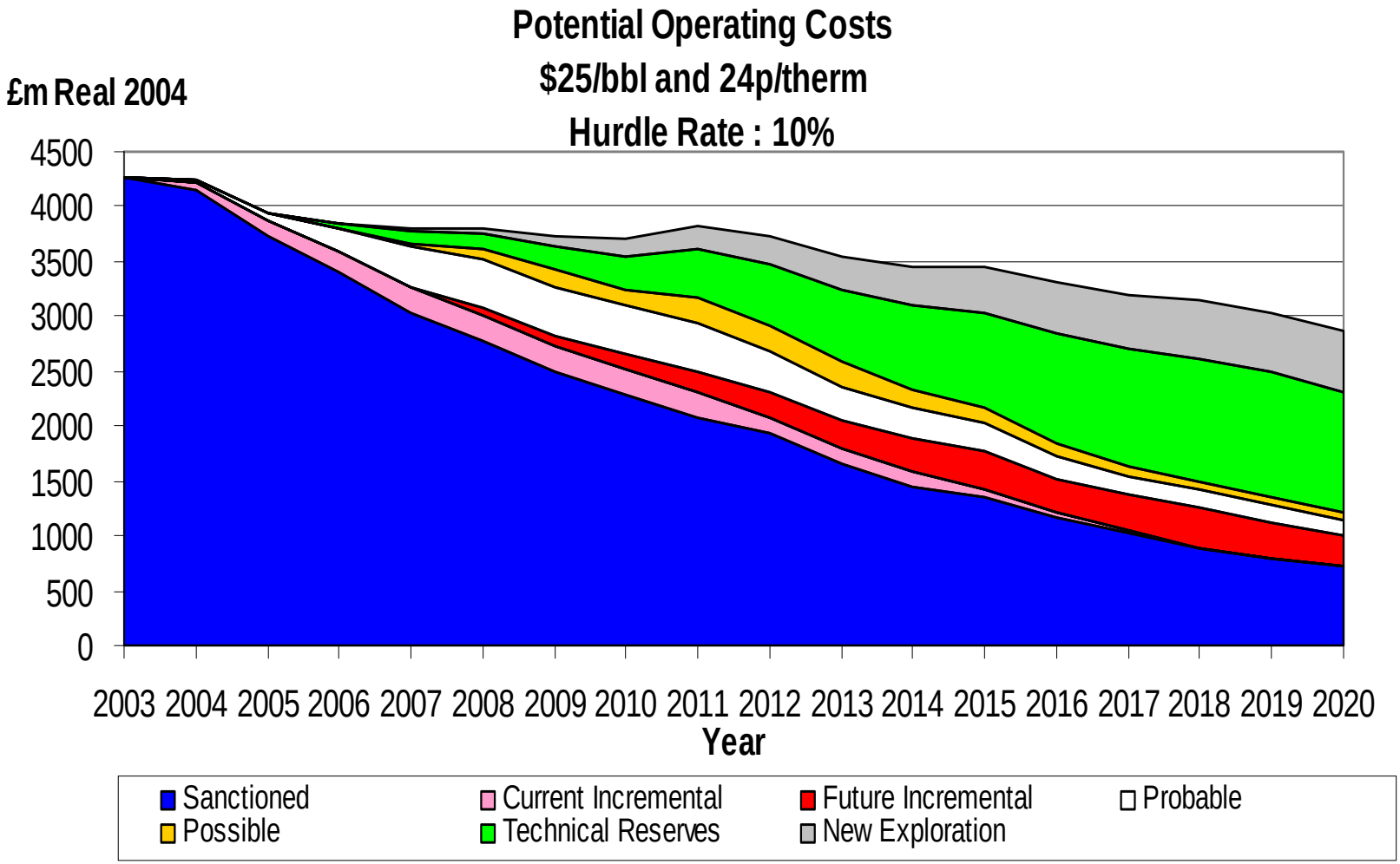

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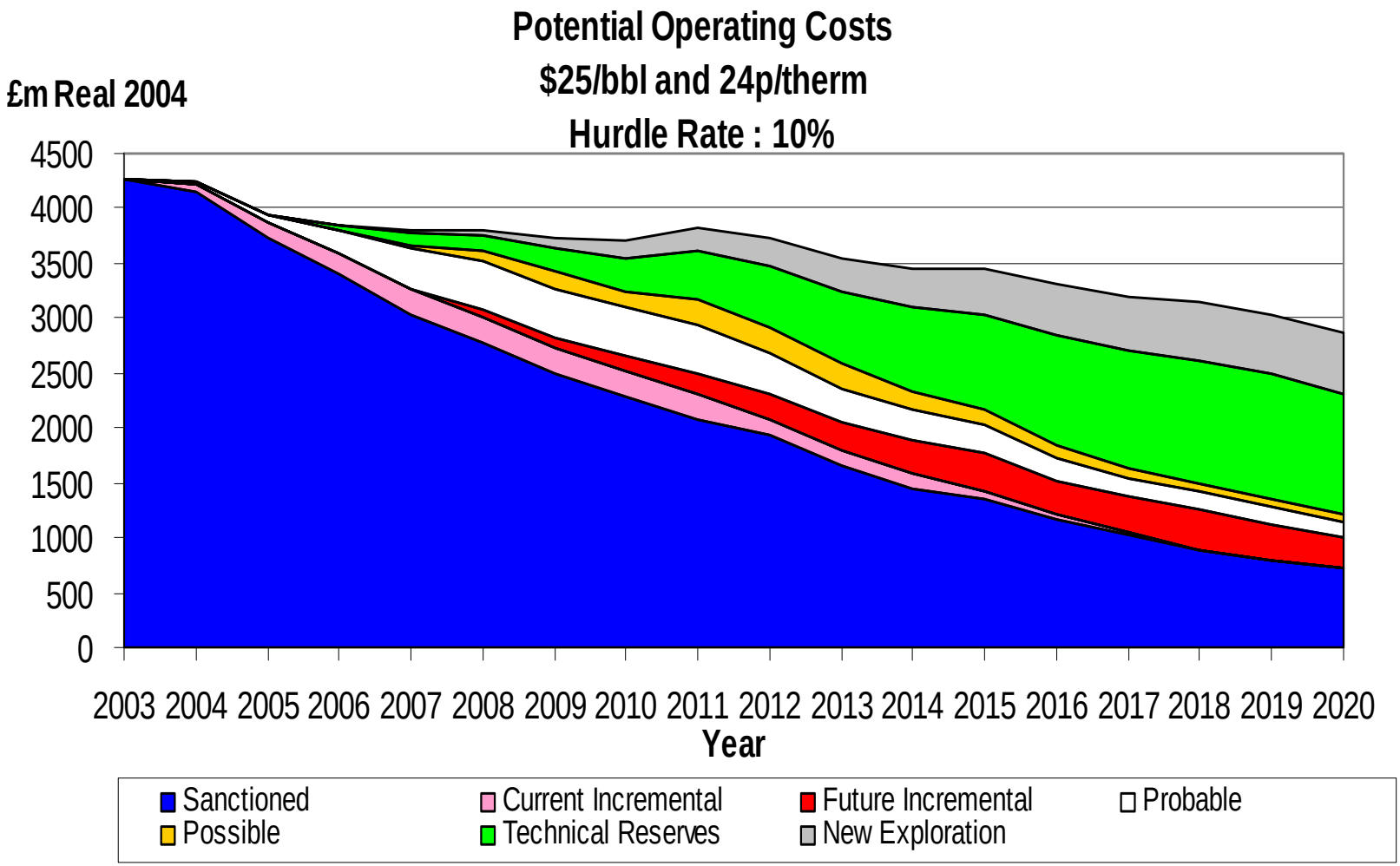

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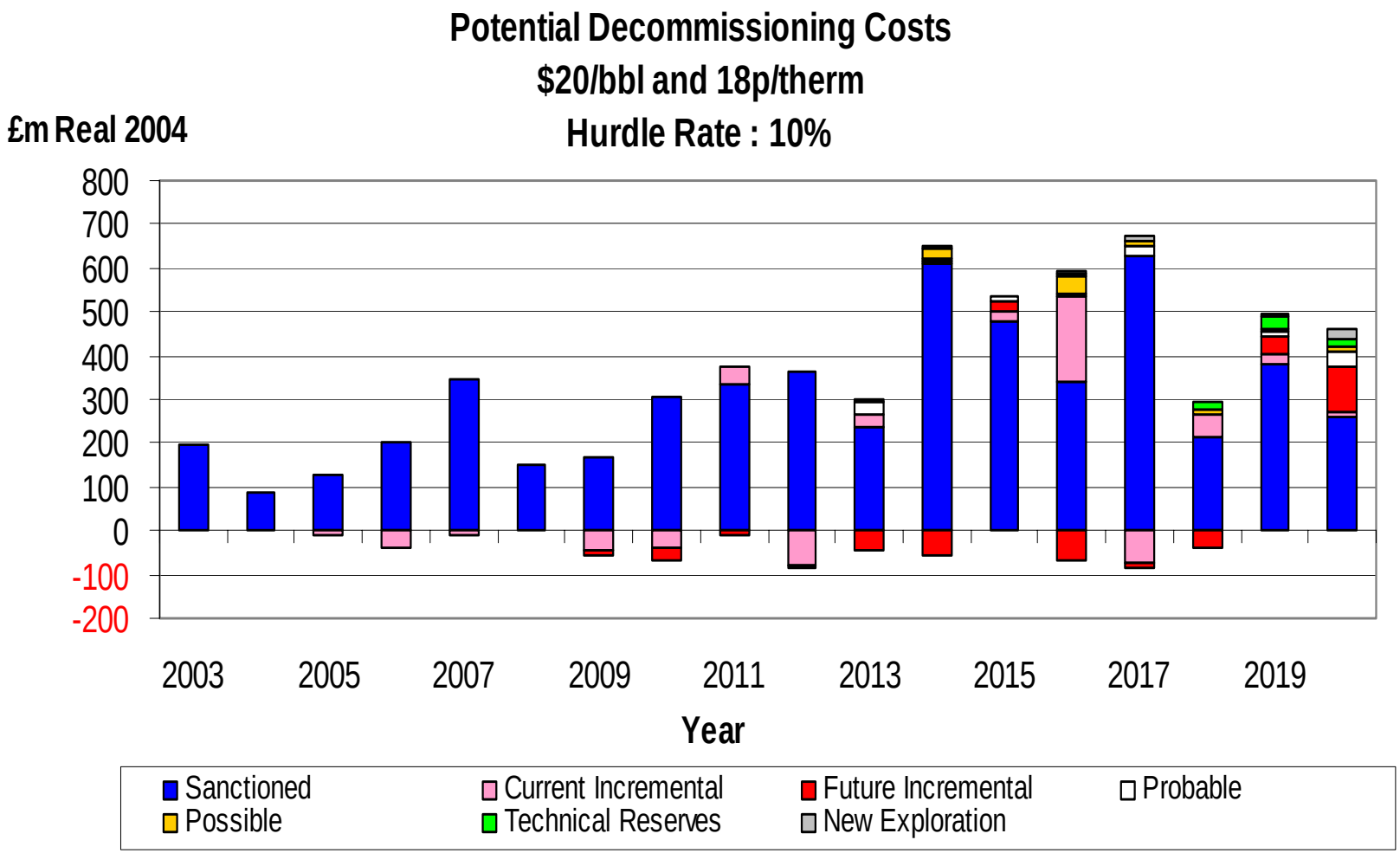

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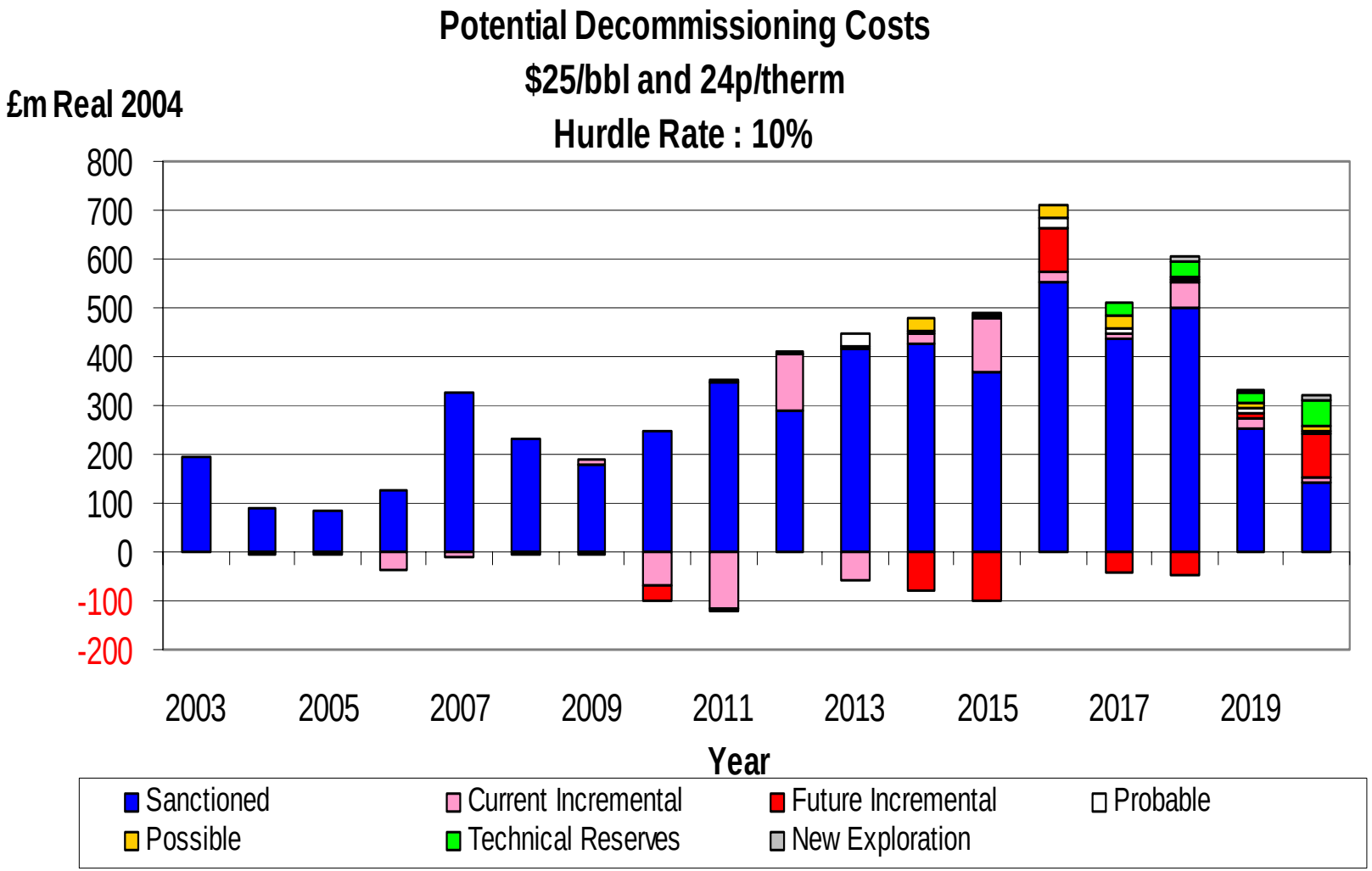
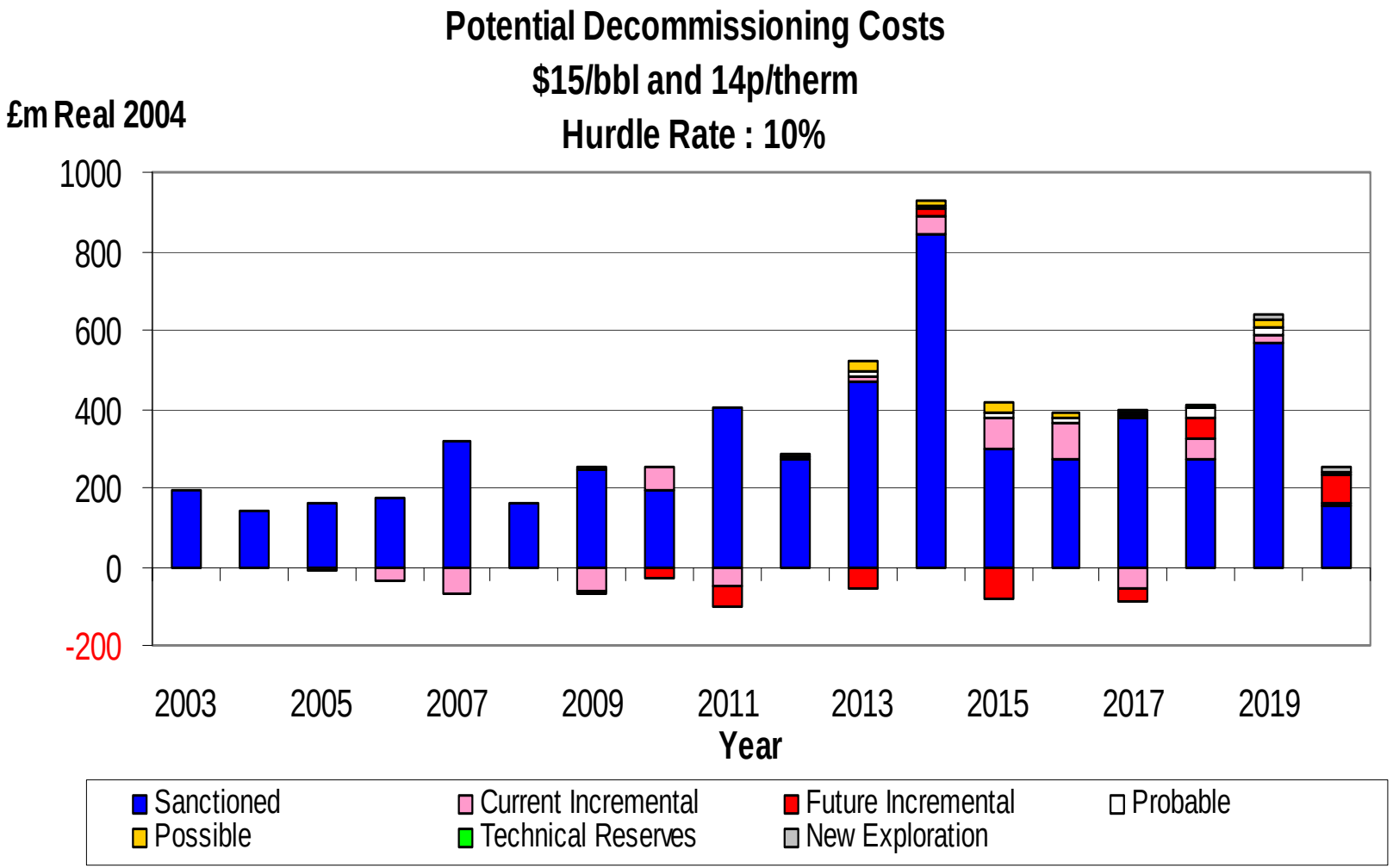

Potential Decommissioning Costs
$25/bbl and 24p/therm
Hurdle Rate : 10%
£m Real 2004
800
700
600
500
400
300
200
100
0
-100
-200
2003
2005
2007
2009
2011
2013
2015
2017
2019
Year
Sanctioned
Current Incremental
Future Incremental
Probable
Possible
Technical Reserves
New Exploration



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Conclusions

1. On current trends potential production is higher than in earlier forecasts.
2. Achievement of the potential is challenging and requires action in several areas:
   a. To maintain/extend infrastructure.
   b. Find imaginative ways to develop many difficult fields in category of technical reserves.
   c. Imaginative ways to develop many more incremental projects in all categories.
3. Increased E and A effort can lead to still further increases in production in medium/longer term.